

FORM PTO-1449  
(Modified)U.S. Department of Commerce  
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Attorney Docket No.: COOL-01400

Serial No.: 10/612,241

INFORMATION DISCLOSURE STATEMENT BY APPLICANT  
(Use Several Sheets if Necessary)

Applicants: James Lovette et al.

Filing Date: July 1, 2003

Group Art Unit: 3743

(37 CFR § 1.98(b))

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## U.S. PATENT DOCUMENTS

Examiner Initials		Serial Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date
TD	AA	6,632,719 B1	10/14/03	DeBoer et al.	438	381	08/31/00
	AB						
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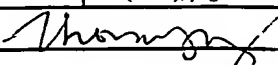
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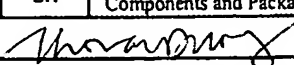
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OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)					
TD	AA	Stephen C. Jacobson et al., "Fused Quartz Substrates for Microchip Electrophoresis", Analytical Chemistry, Vol. 67, No. 13, July 1, 1995, pages 2059-2063.			
TD	AB	Kendra V. Sharp et al., "Liquid Flows in Microchannels", 2002, Vol. 6, pages 6-1 to 6-38.			
TD	AC	Shuchi Shoji et al., "Microflow devices and systems", J. Microelect. Microeng. 4 (1994), pages 157-171, printed in the U.K.			
TD	AD	Angela Rasmussen et al., "Fabrication Techniques to Realize CMOS-Compatible Microfluidic Microchannels", Journal of Microelectromechanical, Vol. 10, No. 2, June 2001, pages 286-297.			
TD	AE	Gad Hetsroni et al., "Nonuniform Temperature Distribution in Electronic Devices Cooled by Flow in Parallel Microchannels", IEEE Transactions on Components and Packaging Technologies, March 2001, Vol. 24, No. 1, pages 16-23.			
TD	AF	X. F. Peng et al., "Heat Transfer Characteristics of Water Flowing through Microchannels", Experimental Heat Transfer An International Journal, Vol. 7, No. 4, October-December 1994, pages 265-283.			
TD	AG	Linan Jiang et al., "Forced Convection Boiling in a Microchannel Heat Sink", Journal of Microelectromechanical Systems, Vol. 10, No. 1, March 2001, pages 80-87.			
TD	AH	Muhammad M. Rahman et al., "Experimental Measurements of Fluid Flow and Heat Transfer in Microchannel Cooling Passages in a Chip Substrate", 1993, EEP-Vol. 4-2, Advances in Electronic Packages, pages 685-692.			
TD	AI	X. F. Peng et al., "Forced convection and flow boiling heat transfer for liquid flowing through Microchannels", 1993, Int. J. Heat Mass Transfer, Vol. 36, No. 14, pages 3421-3427.			
TD	AJ	Lung-Jieh Yang et al., "A Micro Fluidic System of Micro Channels with On-Site Sensors by Silicon Bulk Micromachining", September 1999, Microfluidic Devices and Systems II, Vol. 3877, pages 267-272.			
TD	AK	G. Mohiuddin Mala et al., "Heat transfer and fluid flow in microchannels", 1997, Int. J. Mass transfer, Vol. 40, No. 13, pages 3079-3088, printed in Great Britain.			
TD	AL	J. M. Cuta et al., "Fabrication and Testing of Micro-Channel Heat Exchangers", SPIE Microlithography and Metrology in Micromachining, Vol. 2640, 1995, pages 152-160.			
TD	AM	Linan Jiang et al., "A Micro-Channel Heat Sink with Integrated Temperature Sensors for Phase Transition Study", 1999, 12 <sup>th</sup> IEEE International Conference on Micro Electro Mechanical Systems, pages 159-164.			
TD	AN	Linan Jiang et al., "Fabrication and characterization of a microsystem for a micro-scale heat transfer study", J. Micromech. Microeng. 9 (1999) pages 422-428, printed in the U.K.			
TD	AO	M. B. Bowers et al., "High flux boiling in low flow rate, low pressure drop mini-channel and micro-channel heat sinks", 1994, Int. J. Heat Mass Transfer, Vol. 37, No. 2, pages 321-332.			
TD	AP	Yongendra Joshi, "Heat out of small packages", December 2001, Mechanical Engineer, pages 56-58.			
TD	AQ	A. Rostami et al., "Liquid Flow and Heat Transfer in Microchannels: a Review", 2000, Heat and Technology, Vol. 18, No. 2, pages 59-68.			
TD	AR	Lian Zhang et al., "Measurements and Modeling of Two-Phase Flow in Microchannels with Nearly Constant Heat Flux Boundary Conditions", Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002, pages 12-19.			
TD	AS	Muhammad Mustafizur Rahman, "Measurements of Heat Transfer in Microchannel Heat Sinks", Int. Comm. Heat Mass Transfer, Vol. 27, No. 4, May 2000, pages 495-506.			
TD	AT	Issam Mudawar et al., "Enhancement of Critical Heat Flux from High Power Microelectronic Heat Sources in a Flow Channel", Journal of Electronic Packaging, September 1990, Vol. 112, pages 241-248.			
TD	AU	Nelson Kuan, "Experimental Evaluation of Micro Heat Exchangers Fabricated in Silicon", 1996, HTD-Vol. 331, National Heat Transfer Conference, Vol. 9, pages 131-136.			
TD	AV	E. W. Kreutz et al., "Simulation of micro-channel heat sinks for optoelectronic microsystems", Microelectronics Journal 31(2000) pages 787-790.			
TD	AW	J. C. Y. Koh et al., "Heat Transfer of Microstructure for Integrated Circuits", 1986, Int. Comm. Heat Mass Transfer, Vol. 13, pages 89-98.			
TD	AX	Snezana Konecni et al., "Convection Cooling of Microelectronic Chips", 1992, InterSociety Conference on Thermal Phenomena, pages 138-144.			
TD	AY	Michael B. Kleiner et al., "High Performance Forced Air Cooling Scheme Employing Microchannel Heat Exchangers", 1995, IEEE Transactions on Components, Packaging, and Manufacturing Technology-Part A, Vol. 18, No. 4, pages 795-804.			
TD	AZ	Jerry K. Keska Ph. D. et al., "An Experimental Study on an Enhanced Microchannel Heat Sink for Microelectronics Applications", EEP-Vol. 26-2, Advances in Electronic Packaging, 1999, Vol. 2, pages 1235-1259.			
TD	BA	Shung-Wen Kang et al., "The Performance Test and Analysis of Silicon-Based Microchannel Heat Sink", July 1999, Terahertz and Gigahertz Photonics, Vol. 3795, pages 259-270.			
Examiner:		<i>Thayer</i>		Date Considered: 8/21/06	
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TD	BB	Joseph C. Tramontana, "Semiconductor Laser Body Heat Sink", Xerox Disclosure Journal, Vol. 10, No. 6, November/December 1985, pages 379-381.			
TD	BC	Sarah Arulanandam et al., "Liquid transport in rectangular microchannels by electroosmotic pumping", Colloid and Surfaces A: Physicochemical and Engineering Aspects 161 (2000), pages 89-102.			
TD	BD	Jeffery D. Barner et al., "Thermal Ink Jet Print Head Carriage with Integral Liquid Cooling Capabilities", Xerox Disclosure Journal-Vol. 21, No. 1, January/February 1996, pages 33-34.			
TD	BE	"Autonomous displacement of a solution in a microchannel by another solution", Research Disclosure, June 2001, pages 1046-1047.			
TD	BF	John M. Waldvogel, "Aluminum Silicon Carbide Phase Change Heat Spreader", Motorola, June 1999, Technical Developments, pages 226-230.			
TD	BG	James P. Slupe et al., "An idea for maintaining a stable thermal environment for electronic devices", Research Disclosure, August 2001, page 1312.			
TD	BH	John M. Waldvogel, "A Heat Transfer Enhancement Method for Forced Convection Bonded-Fin Heatsinks", Motorola, December 1997, Technical Developments, pages 158-159.			
TD	BI	"Thin Heat Pipe for Cooling Components on Printed Circuit Boards", IBM Technical Disclosure Bulletin, Vol. 34, No. 7B, December 1991, pages 321-322.			
TD	BJ	"Integrally Grooved Semiconductor Chip and Heat Sink", October 1971, IBM Technical Disclosure Bulletin, Vol. 14, No. 5, page 1425.			
TD	BK	"Cold Plate for Thermal Conduction Module with Inlet for Cooling Water Near Highest Power Chips", IBM Technical Disclosure Bulletin, Vol. 30, No. 5, October 1987, page 413.			
TD	BL	"Circuit Module Cooling with Coaxial Bellow Providing Inlet, Outlet and Redundant Connections to Water-Cooled Element", IBM Technical Bulletin, Vol. 30, No. 5, October 1987, pages 345-347.			
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TD	BN	"Cooling System for Chip Carrier on Card", IBM Technical Disclosure Bulletin, Vol. 31, No. 4, September 1988, pages 39-40.			
TD	BO	"Chip Cooling Device", IBM Technical Disclosure Bulletin, Vol. 30, No. 9, February 1988, pages 435-436.			
TD	BP	W. E. Ahearn et al., "Silicon Heat Sink Method to Control Integrated Circuit Chip Operating Temperatures", IBM Technical Disclosure Bulletin, Vol. 21, No. 8, January 1979, pages 3378-3380.			
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TD	BR	W. J. Kleinfelder et al., "Liquid-Filled Bellows Heat Sink", IBM Technical Disclosure Bulletin, Vol. 21, No. 10, March 1979, pages 4125-4126.			
TD	BS	R. P. Chrisfield et al., "Distributed Power/Thermal Control", IBM Technical Disclosure Bulletin, Vol. 22, No. 3, August 1979, pages 1131-1132.			
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TD	BU	A. J. Arnold, "Structure for the Removal of Heat from an Integrated Circuit Module", IBM Technical Disclosure Bulletin, Vol. 22, No. 6, November 1979, pages 2294-2296.			
TD	BV	U. P. Hwang et al., "Cold Plate for Thermal Conduction Module with Improved Flow Pattern and Flexible Base", IBM Technical Disclosure Bulletin, Vol. 25, No. 9, February 1983, page 4517.			
TD	BW	K. C. Gallagher et al., "Cooling System for Data Processor with Flow Restrictor in Secondary Loop to Limit Bypass-Cooling Water Flow", IBM Technical Disclosure Bulletin, Vol. 26, No. 5, October 1983, page 2658.			
TD	BX	R. C. Chu et al., "Silicon Heat Sink for Semiconductor Chip", IBM Technical Disclosure Bulletin, Vol. 24, No. 11A, April 1982, page 5743.			
TD	BY	J. M. Eldridge et al., "Heat-Pipe Vapor Cooling Etched Silicon Structure", IBM Technical Disclosure Bulletin, Vol. 25, No. 8, January 1983, pages 4118-4119.			
TD	BZ	J. R. Skobern, "Thermoelectrically Cooled Module", IBM Technical Disclosure Bulletin, Vol. 27, No. 1A, June 1984, page 30.			
TD	CA	M. J. Brady et al., "Etched Silicon Integrated Circuit Heat Sink", IBM Technical Disclosure Bulletin, Vol. 27, No. 1B, June 1984, page 627.			
TD	CB	H. D. Edmonds et al., "Heat Exchange Element for Semiconductor Device Cooling", IBM Technical Disclosure Bulletin, Vol. 23, No. 3, August 1980, page 1057.			
TD	CC	R. W. Noth, "Heat Transfer from Silicon Chips and Wafers", IBM Technical Disclosure Bulletin, Vol. 17, No. 12, May 1975, page 3544.			
TD	CD	"Forced Boiling Cooling System with Jet Enhancement for Critical Heat Flux Extension", IBM Technical Disclosure Bulletin, Vol. 39, No. 10, October 1996, page 143.			
Examiner:		<i>Shawna</i>		Date Considered: 8/21/06	
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TD	CE	"Miniature Heat Exchanger for Corrosive Media", IBM Technical Disclosure Bulletin, Vol. 38, No. 01, January 1995, pages 55-56.					
TD	CF	"Self-Contained Active Heat Dissipation Device", IBM Technical Disclosure Bulletin Vol. 39, No. 04, April 1996, pages 115-116.					
TD	CG	B. J. Ronkese, "Centerless Ceramic Package with Directly Connected Heat Sink", IBM Technical Disclosure Bulletin, Vol. 20, No. 9, February 1978, page 3577-3578.					
TD	CH	K. S. Sachar, "Liquid Jet Cooling of Integrated Circuit Chips", Vol. 20, No. 9, February 1978, pages 3727-3728.					
TD	CI	A. H. Johnson, "Device Cooling", IBM Technical Disclosure Bulletin, Vol. 20, No. 10, March 1978, pages 3919-3920.					
TD	CJ	A. L. Pacuzzo et al., "Integrated Circuit Module Package Cooling Structure", IBM Technical Disclosure Bulletin, Vol. 20, No. 10, March 1978, pages 3898-3899.					
TD	CK	R. D. Durand et al., "Flexible Thermal Conductor for Electronic Module", IBM Technical Disclosure Bulletin, Vol. 20, No. 11A, April 1978, page 4343.					
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TD	CP	A. J. Arnold, "Electronic Packaging Structure", IBM Technical Disclosure Bulletin, Vol. 20, No. 11B, April 1978, pages 4820-4822.					
TD	CQ	V. Y. Doo et al., "High Performance Package for Memory", IBM Technical Disclosure Bulletin, Vol. 21, No. 2, July 1978, pages 585-586.					
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TD	CT	"Circuit Module Cooling with Multiple Pistons Contacting a Heat Spreader/Electrical Buffer Plate in Contact with Chip", IBM Technical Disclosure Bulletin, Vol. 31, No. 12, May 1989, page 5-7.					
TD	CU	"TCM-LIKE Circuit Module with Local Heat Sink Resting on Chip and Chip Separated From Coolant by Bellows with Pins and Deflector Plate Attached to Local Heat Sink and Extending Above Bellows into Region of Coolant Flow", IBM Technical Disclosure Bulletin, Vol. 31, No. 11, pages 305-306.					
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TD	CW	"Cold Plate for Thermal conduction Module with Only Peripheral Mounting bolts, Large Surface Area Fin Inserts and Reduced Water Flow and Thermal Resistances", IBM Technical Disclosure Bulletin, Vol. 31, No. 12, May 1989, page 59.					
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TD	CY	"Means of Removing More Heat From a TCM (Or Other Liquid-Cooled Logic Package) By Reducing the Coolant Temperature", IBM Technical Disclosure Bulletin, Vol. 32 No. 5A, Oct 1989, pages 153-154.					
TD	CZ	E. G. Loeffel et al., "Liquid Cooled Module with Compliant Membrane", IBM Technical Disclosure Bulletin, Vol. 20, No. 2, July 1977, pages 673-674.					
TD	DA	V. Y. Doo et al., "Method of Effective Cooling of a High Power Silicon Chip", IBM Technical Disclosure Bulletin, Vol. 20, No. 4, September 1977, page 1436-1437.					
TD	DB	V. Y. Doo et al., "Semiconductor Chip Cooling Package", IBM Technical Disclosure Bulletin, Vol. 20, No. 4, September 1977, pages 1440-1441.					
TD	DC	"Heat Sink Fabrication Method", IBM Technical Disclosure Bulletin, Vol. 27, No. 10A, March 1985, page 5656-5657.					
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TD	DE	"Pin Fin Array Heat Pipe Apparatus", IBM Technical Disclosure Bulletin, Vol. 37, No. 09, September 1994, page 171.					
TD	DF	Youngcheol Joo et al., "Fabrication of Monolithic Microchannels for IC Chip Cooling", 1995, IEEE Micro Electro Mechanical Systems, pages 362-367.					
TD	DG	Haim H. Bau, Optimization of conduits' shape in micro heat exchangers, December 10, 1997, International Journal of Heat and Mass Transfer 41 (1998), pages 2717-2723.					
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TD	DH	V. K. Dwivedi et al., <u>Fabrication of very smooth walls and bottoms of silicon microchannels for heat dissipation of semiconductor devices</u> , January 25, 2000, <u>Microelectronics Journal</u> 31 (2000), pages 405-410.					
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TD	DN	Charlotte Gillot et al., <u>Integrated Micro Heat Sink for Power Multichip Module</u> , September 3, 1999, <u>IEEE Transactions on Industry Applications</u> , Vol. 36, NO. 1, January/February 2000, pages 217-221					
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TD	DT	X.N. Jiang et al., <u>Laminar Flow Through Microchannels Used for Microscale Cooling Systems</u> , 1997, <u>IEEE/CPMT Electronic Packaging Technology Conference</u> , pages 119-122, Singapore.					
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TD	DY	T.S. Raviguruajan et al., <u>Liquid Flow Characteristics in a Diamond-Pattern Micro-Heat-Exchanger</u> , DSC-Vol. 59 <u>Microelectromechanical Systems (IMEMS)</u> , ASME 1996, pages 159-166					
TD	DZ	T.S. Raviguruajan, <u>Impact of Channel Geometry on Two-Phase Flow Heat Transfer Characteristics of Refrigerants in Microchannel Heat Exchangers</u> , May 1998, <u>Journal of Heat Transfer</u> , Vol. 120, pages 485-491					
TD	EA	J. Pfahler et al., <u>Liquid Transport in Micron and Submicron Channels</u> , March 1990, <u>Sensors and Actuators</u> , A21-A23 (1990), pages 431-434.					
TD	EB	Kenneth Pettigrew et al., <u>Performance of a MEMS based Micro Capillary Pumped Loop for Chip-Level Temperature Control</u> , 2001, <u>The 14<sup>th</sup> IEEE International Conference on Micro Electro Mechanical Systems</u> , pages 427-430.					
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TD	EF	X.F. Peng et al., <u>Cooling Characteristics with Microchanneled Structures</u> , 1994, <u>Enhanced Heat Transfer</u> , Vol. 1, No. 4, pages 315-326, printed in the United States of America.					
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TD	EJ	C.R. Friedrich et al., <u>Micro heat exchangers fabricated by diamond machining</u> , January 1994, Precision Engineering, Vol. 16, No. 1, pages 56-59					
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TD	EO	Gh. Mohiuddin Mala et al., <u>Flow characteristics of water through a microchannel between two parallel plates with electrokinetic effects</u> , 1997, Int. J. Heat and Fluid Flow, Vol. 18, No. 5, pages 489-496					
TD	EP	Stephanus Buttgenbach et al., <u>Microflow devices for miniaturized chemical analysis systems</u> , November 4-5, 1998, SPIE-Chemical Microsensors and Applications, Vol. 3539, pages 51-61.					
TD	EQ	Sarah Arunlanandam et al., <u>Liquid transport in rectangular microchannels by electroosmotic pumping</u> , 2000, Colloids and Surfaces A: Physicochemical and Engineering Aspects Vol. 161 (2000), pages 89-102.					
TD	ER	Susan L. R. Barker et al., <u>Fabrication, Derivatization and Applications of Plastic Microfluidic Devices</u> , Proceedings of SPIE, Vol. 4205, November 5-8, 2000, pages 112-118.					
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TD	EV	Ray Beach et al., <u>Modular Microchannel Cooled Heatsinks for High Average Power Laser Diode Arrays</u> , April 1992, IEEE Journal of Quantum Electronics, Vol. 28, No. 4, pages 966-976.					
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TD	EZ	Chun Yang et al., <u>Modeling forced liquid convection in rectangular microchannels with electrokinetic effect</u> , 1998, International Journal of Heat and Mass Transfer 41 (1998), pages 4229-4249.					
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TD	FC	B. X. Wang et al., <u>Experimental investigation on liquid forced-convection heat transfer through microchannels</u> , 1994, Int. J. Heat Mass Transfer, Vol. 37 Suppl. 1, pages 73-82.					
TD	FD	Kambiz Vafai et al., <u>Analysis of two-layered micro-channel heat sink concept in electronic cooling</u> , 1999, Int. J. Heat Mass Transfer, 42 (1999), pages 2287-2297.					
TD	FE	Gokturk Tune et al., <u>Heat transfer in rectangular microchannels</u> , 2002, Int. J. Heat Mass Transfer, 45 (2002), pages 765-773.					
TD	FF	D. B. Tuckerman et al., <u>High-Performance Heat Sinking for VLSI</u> , 1981, IEEE Electron Device Letters, Vol. EDL-2, No. 5, pages 126-129.					
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TD	FI	S. Sasaki et al., <u>Optimal Structure for Microgrooved Cooling Fin for High-Power LSI Devices</u> , Electronic Letters, December 4, 1986, Vol 22, No. 25.					
TD	FJ	Vijay K. Samalam, <u>Convective Heat Transfer in Microchannels</u> , September 1989, Journal of Electronic Materials, Vol. 18, No. 5, pages 611-617.					
TD	FK	Sanjay K. Roy et al., <u>A Very High Heat Flux Microchannel Heat Exchanger for Cooling of Semiconductor Laser Diode Arrays</u> , 1996, IEEE Transactions on components, packaging, and manufacturing technology-part B, Vol. 19, No. 2, pages 444-451.					
Examiner: <i>Shawna</i>				Date Considered: 8/21/06			
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.							

FORM PTO-1449 (Modified)		U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No.: COOL-01400	Serial No.: 10/612,241
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Several Sheets If Necessary)			Applicants: James Lovette et al.	
			Filing Date: July 1, 2003	Group Art Unit: 3743
(37 CFR § 1.98(b))				
OTHER DOCUMENTS (Including Author, Title, Date, Relevant Pages, Place of Publication)				
TD	FL	Charlotte Gillot et al., Integrated Single and Two-Phase Micro Heat Sinks Under IGBT Chips, IEEE Transactions on Components and Packaging Technology, Vol. 22 No. 3, September 1999, pages 384-389.		
TD	FM	H. Krumm "Chip Cooling", IBM Technical Disclosure Bulletin, Vol. 20, No. 7, December 1977, pg. 2728.		
TD	FN	Jae-Mo Koo et al., "Modeling of Two-Phase Microchannel Heat Sinks for VLSI Chips", Mech. Eng. Depart. of Stanford University, pp. 422-426.		
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Examiner: <i>Thompson</i>		Date Considered: 8/21/06		
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U.S. PATENT DOCUMENTS							
Examiner Initials	Serial / Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date	
	AA						
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FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS								
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						Yes	No	
TD	AK	DE 197 10 716 C2	09/24/98	DE	H01S	5/024	X	
TD	AL	WO 01/25711 A1	04/12/01	PCT	F28F	3/04	X	
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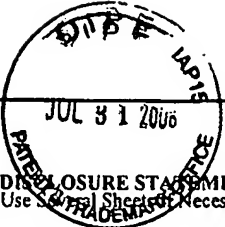
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Examiner: <i>Shammy</i>	Date Considered: 8/21/02
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<b>U.S. PATENT DOCUMENTS</b>									
Examiner Initials	Serial / Patent Number	Issue Date	Applicant / Patentee	Class	Subclass	Filing Date			
TD	AA	4,494,171	01/15/85	Bland et al.	361	386	08/24/82		
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TD	AD	6,196,307 B1	03/06/01	Ozmat	165	185	06/17/98		
TD	AE	6,508,301 B2	01/21/03	Marsala	165	80.4	04/17/01		
TD	AF	US 2004/0112571 A1	06/17/04	Kenny et al.	165	80.3	10/30/03		
TD	AG	US 2005/0168949 A1	08/04/05	Tilton et al.	361	699	01/30/04		
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	AJ								
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# ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

7/10/06

## Title of Invention

MULTI-LEVEL MICROCHANNEL HEAT EXCHANGERS

Application Number : 10/612241  
Confirmation Number: 3319  
First Named Applicant: James Lovette  
Attorney Docket Number:  
Art Unit:  
Examiner:  
Search string: ( 5417280 ).pn



Certification: This Information Disclosure Statement was submitted under the following conditions, which satisfies the requirement under 37 CFR 1.97(e). The filer certified:

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

## US Patent Documents

**Note:** Applicant is not required to submit a paper copy of cited US Patent Documents

init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
TD	1	5417280	1995-05-23	Hayashi et al.			

## Signature

Examiner Name	Date
<i>Shawna</i>	8/21/06

# ELECTRONIC INFORMATION DISCLOSURE STATEMENT

2/1/05

Electronic Version v18

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Confirmation Number: 3319  
First Named Applicant: James Lovette  
Attorney Docket Number:  
Art Unit:  
Examiner:  
Search string: ( 6438984 or 6581388 or 6587343 ).pn



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## US Patent Documents

**Note:** Applicant is not required to submit a paper copy of cited US Patent Documents

init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
M	1	6438984	2002-08-27	Novotny et al.	B1		
M	2	6581388	2003-06-24	Novotny et al.	B2		
M	3	6587343	2003-07-01	Novotny et al.	B2		

## Signature

Examiner Name	Date
	8/21/05

1/26/05

# ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

<b>Title of Invention</b>	<b>MULTI-LEVEL MICROCHANNEL HEAT EXCHANGERS</b>
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Application Number : 10/612241

Confirmation Number: 3319


First Named Applicant: James Lovette

Attorney Docket Number:

Art Unit:

Examiner:

Search string: ( 2039593 or 4574876 or 6206022 or 6253835 or 6437981 ).pn



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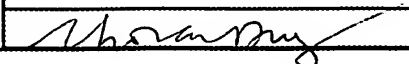
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**US Patent Documents**

**Note:** Applicant is not required to submit a paper copy of cited US Patent Documents

init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
TD	1	2039593	1936-05-05	T. N. Hubbuch et al.			
TD	2	4574876	1986-03-11	Aid			
TD	3	6206022	2001-03-27	Tsai et al.	B1		
TD	4	6253835	2001-07-03	Chu et al.	B1		
TD	5	6437981	2002-08-20	Newton et al.	B1		

**Signature**


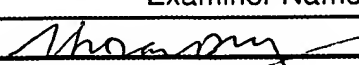
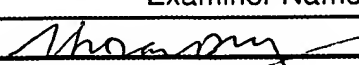
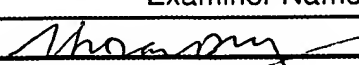
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<b>Title of Invention</b>	<b>MULTI-LEVEL MICROCHANNEL HEAT EXCHANGERS</b>																																																										
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